

REMARKS

By the present amendment, non-elected claims 1 and 5-15 have been canceled and claims 19-25 have been added. Support for new claims 19-25 is found in the original application, in particular the drawings.

Claims 2, 4, and 16-25 are pending in the present application. The claims are directed to an apparatus for the pyrolysis of waste.

As a preliminary, Applicant and Applicant's representative thank the Examiner for the personal interview which was held on August 26, 2003. A record of the substance of the interview is included in the Interview Summary.

In the Office Action, claims 1 and 5-15 remain subject to a restriction requirement.

Claims 1 and 5-15 have been canceled. Accordingly, the restriction requirement is moot.

Next, in the Office Action, claims 2, 4 and 16-18 are rejected under 35 U.S.C. 103(a) as obvious over US 4,060,042 to Baraldi et al. (Baraldi) in view of US 3,916,806 to Giraud (Giraud). It is alleged in the previous Office Action, to which the present Office Action refers, that it would have been obvious to modify the cylindrical combustion zone 8 of Baraldi into a frustoconical shape as disclosed in Giraud.

The rejection is respectfully traversed. A person of ordinary skill in the art would not have modified the cylindrical combustion zone 8 of Baraldi into a frustoconical shape because the apparatuses of Baraldi and Giraud are so different that the purposes and functions of the frustoconical shape in the apparatus of Giraud would not be performed in the apparatus of Baraldi. As a result, there would have been no motivation to combine the references as alleged in the Office Action.

Generally speaking, the apparatus of Baraldi is a high temperature, excess air combustor. Accordingly, the combustion zone of Baraldi has a cylindrical shape with a co-current flow of preheated air and downstream recuperation of combustion fumes. Combustion relies on an excess of air supply flowing through the combustion zone. To improve efficiency of the combustion zone, the precombustion zone of Baraldi is designed to retain liquid waste until complete evaporation and to ignite the solid waste by means of the co-current air flow.

In contrast, the apparatus of Giraud is designed to process a mixture of liquid and solid waste at a relatively lower temperature. Both liquid and solid waste are passed from the preheating to the combustion zone. The preheating zone provides heating and possibly pyrolysis of the waste prior to passing it to the combustion zone. The oxidant is injected directly in the combustion zone, and combustion fumes are recuperated in counter-flow, hence the frustoconical shape. Thus, the apparatuses of Baraldi and Giraud correspond to very different technologies for treating waste.

In particular, Giraud uses a frustoconical shape to avoid a discontinuity between the precombustion and combustion zones (see Giraud at col. 2, lines 15-16), and to ensure the mixing of the solid and liquid waste (see Giraud at col. 2, lines 35-37). These functions are not needed and not performed in the apparatus of Baraldi, which has a step between the precombustion zone and the combustion zone, (see Figures of Baraldi) to create an evaporation zone for the liquid waste in the precombustion zone (see Baraldi at col. 3, lines 45-47). Therefore, the teaching in Giraud does not provide any incentive to use a frustoconical shape in the apparatus of Baraldi.

Furthermore, the teachings of Baraldi and Giraud regarding liquid waste treatment are incompatible, because the motivations in Baraldi for providing a step between the precombustion

zone and the combustion zone are irreconcilable with the reasons for avoiding such a step in Giraud. Namely, Baraldi provides a step, not only to compensate the differences between the dimensions of the larger drying zone and the diameter of the narrower combustion zone, but also to keep the liquid waste in the drying zone to be evaporated, while ensuring a fast transfer of the dried waste across the step by means of a conveyor (see Baraldi at col. 2, lines 29-30). In contrast, Giraud's objective is to avoid a separation of liquids and solids passing into the combustion zone, and accordingly, to avoid a discontinuity between the precombustion and combustion zone. Because of these fundamental differences between Baraldi and Giraud, a person of ordinary skill in the art would not be motivated to incorporate features of the apparatus of Giraud into the apparatus of Baraldi.

In addition, a person of ordinary skill in the art would be taught away from modifying the cylindrical combustion zone 8 of Baraldi into a frustoconical shape, because the diameter reduction on the downstream side would be detrimental to the co-current flow of combustion air and fumes with the waste. Specifically, in Baraldi, the air is blown from the upstream side of the precombustion zone for both the precombustion and the combustion zones, and the combustion fumes are collected at the downstream end of the cylindrical combustion zone 8. As a result, a narrowing of the combustion zone 8 toward its downstream side would block the flow of combustion air and combustion fumes toward the downstream side of the combustion zone. In other words, a frustoconical shape would contradict an important purpose of the cylindrical combustion zone, which is to ensure an appropriate co-current flow of air and evacuation of fumes.

Lastly, even if, arguendo, a person of ordinary skill in the art disregarded the problems of air and fumes flow and the differences in liquid and solid waste treatment between Baraldi and Giraud,

and attempted to adapt the frustoconical shape of Giraud into the apparatus of Baraldi, that person would clearly eliminate the step in the apparatus of Baraldi between the precombustion and the combustion zones, because Giraud indicates that avoiding a discontinuity between the precombustion and combustion zones is one of the main purposes for using a frustoconical shape (see Giraud at col. 2, lines 15-16). As a result, any combination of Baraldi and Giraud would not result in the presently claimed invention.

In summary, the motivations stated by Giraud for using a frustoconical shape and for removing a step between precombustion and combustion zones are not applicable to the apparatus of Baraldi, but, on the contrary, a frustoconical shape would be detrimental to the performance of the apparatus of Baraldi. Accordingly, a person of ordinary skill in the art would have no motivation to combine Baraldi and Giraud as alleged in the Office Action.

In contrast, the present inventor has discovered that, by providing a retaining threshold between a cylindrical portion and a truncated cone portion, as recited in the present claims, it is possible to improve the pyrolysis of the waste before passing into the combustion zone, so that the efficiency of combustion is increased and the production of pollutants in the fumes is minimized, as described in the present specification. This feature of the presently claimed invention and its advantages are not taught or suggested in any of the cited references taken alone or in any combination.

Specifically, in the absence of a motivation to combine or modify the references, the simple fact that the references can be combined does not establish *prima facie* obviousness, *see In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990), in particular when the proposed modification would be

detrimental to the operation of the device, *see In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), but there must be “some teaching, suggestion, or motivation... in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” See MPEP 2143.01.

In the present case, there is no indication in either Baraldi and Giraud or in the general knowledge in the field that would suggest or provide a motivation to combine the references as alleged in the Office Action. Rather, the person of ordinary skill in the art would be taught away from such combination because of the expected problems and drawbacks, as discussed above. In the alternative, any modification of Baraldi in view of Giraud would result in elimination of the step as taught in Giraud. Therefore, the present claims are not obvious over the cited references taken alone or in any combination.

In addition, with respect to claims 19, 21, and 24, it is submitted that, even if the apparatus of Baraldi was modified to confer a frustoconical shape to the combustion zone 8, as alleged in the Office Action, the air supply would remain a flow of excess air blown from the precombustion zone. Accordingly, the combustion zone of the modified apparatus would not comprise a network of nozzles fed via channels distributing combustion air in a substochiometric amount, as recited in these claims. Therefore, for this reason alone, claims 19, 21 and 24 are not obvious over the cited references taken alone or in any combination.

Similarly, with respect to claims 20 and 23, since the combustion air would flow co-currently the recuperation of combustion fumes would be at the downstream end of the combustion zone in the apparatus of Baraldi, even modified by Giraud as alleged in the Office Action, the recovery chimney would not be placed on the cylinder in the rotating cell as recited in these claims. Therefore,

for this reason alone, claims 20 and 23 are not obvious over the cited references taken alone or in any combination.

Further, with respect to claims 22 and 25, the apparatus of Baraldi, even modified by Giraud as alleged in the Office Action, would maintain a horizontal longitudinal axis to the combustion zone, as provided in Baraldi. Accordingly, the main longitudinal axis of the rotating cell would not be inclined with respect to the horizontal as recited in these claims. Therefore, for this reason alone, claims 22 and 25 are not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejection should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

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In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 01-2340.

Respectfully submitted,

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